

**The Claims:**

1. An alloy steel composition which includes the following constituents by weight:

|            |             |
|------------|-------------|
| carbon     | 0.5 – 3.5%  |
| 5 silicon  | 0.2 – 0.8%  |
| manganese  | 0.5 – 1.5%  |
| nickel     | 0.1 – 2.0%  |
| chromium   | 1.0 – 3.0%  |
| molybdenum | 0.1 – 0.5%  |
| 10 copper  | 0.1 – 2.0%. |
2. An alloy steel composition according to claim 1 wherein the percentage composition of nickel is 0.10 – 0.45% by weight.
- 15 3. An alloy steel composition according to claim 1 or 2 wherein the percentage composition of copper is 0.10 – 0.45% by weight.
4. A metal casting produced from an alloy steel composition which includes the following constituents by weight:

|               |             |
|---------------|-------------|
| 20 carbon     | 0.5 – 3.5%  |
| silicon       | 0.2 – 0.8%  |
| manganese     | 0.5 – 1.5%  |
| nickel        | 0.1 – 2.0%  |
| chromium      | 1.0 – 3.0%  |
| 25 molybdenum | 0.1 – 0.5%  |
| copper        | 0.1 – 2.0%. |
5. A metal casting according to claim 4 which has a substantially pearlitic microstructure throughout its entirety.
- 30 6. A metal casting according to claim 4 or 5 wherein the hardness of the casting is

greater than 310 HB.

7. A metal casting according to claim 4 or 5 wherein the hardness of the casting is greater than 335 HB.
- 5 8. A metal casting according to claim 4 for use in applications, which result in high wear upon the casting.
9. A metal casting according to claim 8 for use as components in autogenous grinding mills, semi-autogenous grinding mills or ball mills.
- 10 10. A metal casting according to claim 9 wherein the component is any component subject to wear.
- 15 11. A metal casting according to claim 9 or 10 wherein the components are lifter bars, liners, pulp lifters and/or grates.
12. A metal casting according to claim 8 wherein, after about 50 to 100 mm of wear has occurred on the casting, the hardness of the casting is greater than 310 HB and preferably greater than 330 HB.
- 20 13. A method of producing a metal casting composed of the alloy steel composition according to any one of claims 1 to 3 characterised by the steps of:
  - i. pouring the molten alloy composition into a metal casting mould;
  - 25 ii. cooling the metal casting at ambient temperature; and
  - iii. grind casting and gauge to profile.
14. A method according to claim 13 which includes the step of air blasting when the metal casting is greater than 300 mm in thickness.
- 30 15. A method according to claim 14 which includes the step of tempering at about

580°C.

16. An alloy steel composition which includes the following constituents by weight:
- |    |            |               |
|----|------------|---------------|
|    | carbon     | 0.80 – 0.85%  |
| 5  | silicon    | 0.42 – 0.48%  |
|    | manganese  | 0.85 – 0.95 % |
|    | nickel     | 0.32 – 0.38%  |
|    | chromium   | 2.05 – 2.25%  |
|    | molybdenum | 0.30 – 0.37%  |
| 10 | copper     | 0.32 – 0.38%. |